

InGaP DHBT for High Efficiency L-band T/R Module, Phase I

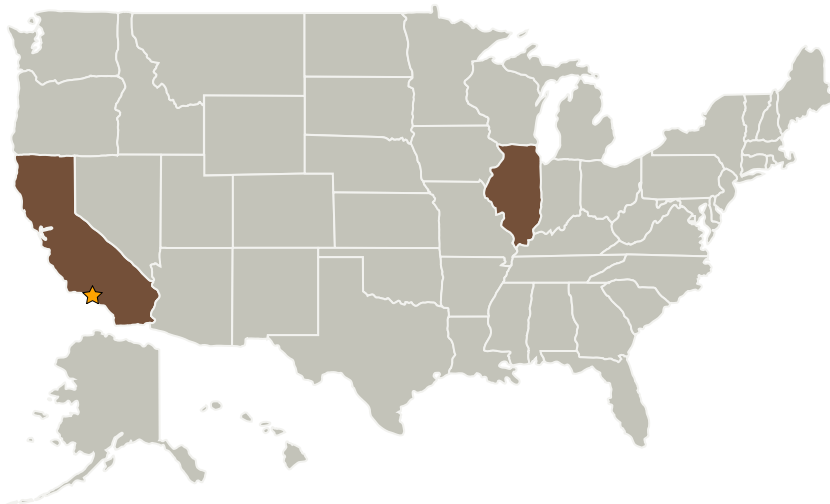
Completed Technology Project (2007 - 2007)



Project Introduction

A fully monolithically integrated L-band T/R module using InGaP/GaAs-based HBTs (heterojunction bipolar transistors) for both the transmit and receive functions is proposed. We plan to improve the efficiency by implementing a DHBT (double heterojunction bipolar transistor) InGaP HBT which is designed reduce the offset voltage. This DHBT design can offer a higher efficiency as well as increasing the safe operation region (SOA), which benefits both the low noise and high power requirements of a T/R module. The footprint of the device is expected to be reduced by 20-30% by integrating the T/R function using the same device InGaP DHBT platform. GaAs based devices are critical for the realization of reduced size and reduced power consumption MMIC (monolithic microwave integrated circuits) which provide the fundamental building blocks of T/R modules. InGaP HBT provide the lowest cost technology platform for high frequency devices in comparison to other device technologies such as Si-Ge and InP. In addition, InGaP/GaAs HBTs have been shown to be inherently radiation hard for both proton and g exposure, and are well suited for use in the space environment.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
MicroLink Devices, Inc.	Supporting Organization	Industry Minority-Owned Business	Niles, Illinois

Primary U.S. Work Locations

California	Illinois
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX02 Flight Computing and Avionics
 - └ TX02.1 Avionics Component Technologies
 - └ TX02.1.6 Radiation Hardened ASIC Technologies